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THE COMPLETE LIFE HISTORY OF STAPHYLUS HAYHURSTI

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THIS OBSCURE LITTLE SKIPPER is one of those species that are easily overlooked by the non-observant collector. It inhabits a wide range in the eastern United States extending at least as far as Pennsylvania and Nebraska and south to Florida and Texas, being replaced in southern Texas by the closely related *Staphylus mazans* Reakirt. Host plants include *Chenopodium* and *Alternanthera* and the species is rather localized to areas where these weeds grow. One of the peculiarities of *hayhursti* is the moth like habit of spreading the wings out flat against the surface upon which it alights. It is strongly attracted to certain flowers and at times I have found a dozen or more specimens clustered about a bed of Spearmint flowers (*Mentha spicata*) *during late July* in a good local. Sweet Clover (Melilotus) also seems to have a particular attraction for the species. In rural areas the best collecting spots for *hayhursti* will be associated with moist rather shady habitat. An idea spot is a small creek running through a wooded area or the weedy edges beside an old railroad track. In urban areas it is drawn to vacant lots grown up in weeds where an ample supply of the host plants can be found growing. There are two distinct broods produced each year in Missouri and probably at least three further south. In a normal year you can find *hayhursti* from the third week in May to the end of the third week in June and again from mid July until the end of August. The larvae produced by the second brood normally hibernate in the third instar in this area. An occasional third brood specimen is produced but these are very rare.

From time to time scattered bits of information on the early stages of this species have appeared but as far as I can ascertain there has been no complete life history published on this butterfly. In May of 1962 I was able to obtain 49 ova from a worn female placed on potted Lambs Quarters and covered with a bag of Nylon netting. From these eggs 21 adults were reared and the larvae were carefully observed and recorded in detail. Since Edwards' description of *hayhursti* in 1870 was based on material from "Missouri" this description should approximate topotypical specimens. The illustrations which accompany this description were drawn by William H. Howe.

OVA: Eggs were obtained from 25 to 28 May. The eggs were laid singly usually beneath the leaves with a few placed above and a few others on the stems. The ova is very small, less than 1 mm. in diameter and has a flattened circular appearance. The color is a deep orange brown with a raised cream colored pattern of irregular ridges. The six largest radiating out from the top center to the sides. Under low power magnifaction the egg has the appearance of a white star on an orange background.

FIRST INSTAR LARVA: The first emergence occurred on 1 June. The newly hatched larva is translucent light orange, abdominal segments 8, 9 and 10 are dull brown dorsally. The head and prothoracic shield are shiny black. After the first day of feeding the body assumes a pale green color with orange edges. The first meal is a hole eaten through the top of a leaf. The second day a small tent about one eighth inch square is made near the tip of a leaf by cutting three sides and folding the severed section to the top of the leaf and fastening it with a few threads of silk.

SECOND INSTAR LARVA: Body dark green, abdominal segments 9 and 10 pale orange brown, abdomen translucent orange yellow. Head and prothoracic shield clear black. The larvae leave the tent a short distance and feed during the day on top of the leaves, eating holes through the leaves. The larvae are very agile and when disturbed they rapidly retreat to the tent.

THIRD INSTAR LARVA: Body pale watery green with no visible markings, thickly covered with short white setae, a few longer hairs on the last segment. Abdominal segments 8, 9 and 10 are creamy yellow with a pale brown tone dorsally. The neck is a slightly paler green than the body. Due to the translucence of the body the edges of the abdomen appear to be pale yellow. The prothoracic shield has a pale green dorsal area shading into deep purple at the sides. Head deep purple and thickly covered with short white setae, face deeply cleft vertically at the epicranial suture. Mandibles are a contrasting shade of reddish purple.

FOURTH INSTAR LARVA: Body medium green covered with short white setae, abdominal segments 8, 9 and 10 slightly paler, section 10 with a few longer hairs. The neck is slightly paler and the prothoracic shield is visible only as two pale brown subdorsal spots. The head is deep purple, almost black and thickly covered with medium length white hair. The growth rate is greatly accelerated in this instar.

FINAL INSTAR LARVA: Length of fully grown larvae, 20-23 mm. Body ground color is a deep green with a rosy overcast, intersegmental folds pinkish green. Legs cream color with the rest of the abdomen and the prolegs deep green. The body is thickly covered with fine white hair, some slightly longer on the last segment. The spiracles are pale creamy white and slightly raised. The skin is quite translucent, the heart visible as a deep green mid dorsal line. In this instar

the prothoracic shield has turned to a very pale brown color. Head deep purple almost black, thickly covered with white hair and deeply cleft vertically at the epicranial suture. The tent in the final instar consists of an entire leaf folded together and pupation occurs in the tent with the addition of a very thin lining of silk and a silken pad to which the cremaster is attached.

PUPA: First pupation occurred 27 June. Length of pupae 13-17 mm., width at widest point of wing cases 3.5 mm. The pupa case is thickly dusted with a white powdery bloom. Abdomen pale orange brown, the wing cases and thorax light olive brown. Spiracles dark brown and noticeably raised. The abdomen and head are thickly covered with short orange bristles. Cremaster dark brown consisting of a single sharp point. Adults emerged from the 10th to 16th of July, males and females emerging at the same time. All specimens were quite large and the measurements for the larvae and pupae given should compare closely with those of wild specimens. The time spent in each instar was quite constant, usually five days elapsing between moults.

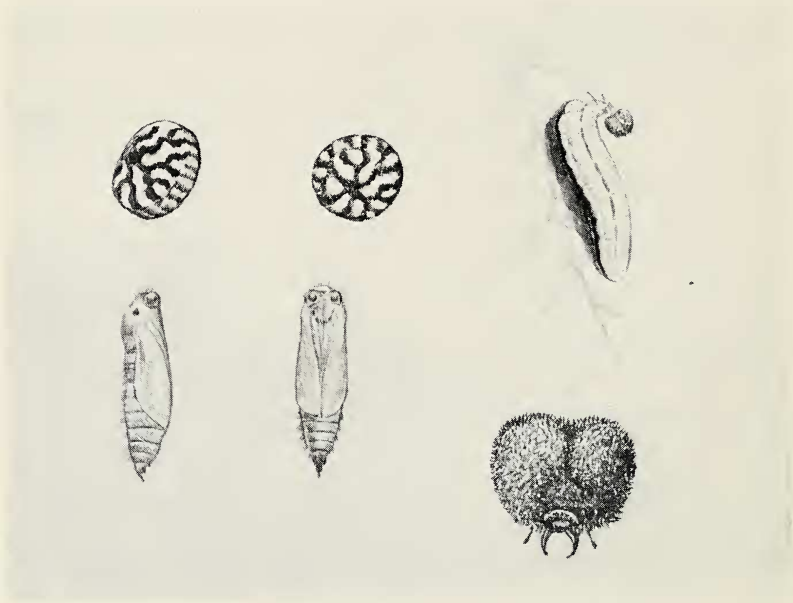

Fig. 1. Early stages of Staphylus hayhursti. Ova, pupa, mature larva and enlarged front view of the head.